



Westinghouse Electric Company
Nuclear Power Plants
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

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Your ref: Project Number 740
Our ref: DCP/NRC1928

52-006

June 8, 2007

Subject: AP1000 COL Response to Requests for Additional Information (TR #28)

In support of Combined License application pre-application activities, Westinghouse is submitting a response to NRC request for additional information (RAI) on AP1000 Standard Combined License Technical Report 28, APP-GW-GLN-024, Rev. 0, Setpoint Calculations for Protective Functions. This RAI response is submitted as part of the NuStart Bellefonte COL Project (NRC Project Number 740). The information included in the response is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification.

Response is provided for request TR28-1, transmitted in NRC letter dated April 19, 2007 from Steven D. Bloom to Andrea Sterdis, Subject: Westinghouse AP1000 Combined License (COL) Pre-application Technical Report 28 – Request for Additional Information (TAC No. MD2126).

Pursuant to 10 CFR 50.30(b), the proprietary and non-proprietary response to request for additional information on Technical Report 28 are submitted as Enclosures 3 and 4 under the attached Oath of Affirmation.

Also enclosed is one copy of the Application for Withholding, AW-07-2295 (non-proprietary) with Proprietary Information Notice, and one copy of the associated Affidavit (non-proprietary).

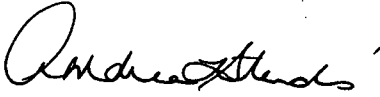
This submittal contains proprietary information of Westinghouse Electric Company, LLC. In conformance with the requirements of 10 CFR Section 2.390, as amended, of the Commission's regulations, we are enclosing with this submittal an Application for Withholding from Public Disclosure and an affidavit. The affidavit sets forth the basis on which the information identified as proprietary may be withheld from public disclosure by the Commission.

Correspondence with respect to the affidavit or Application for Withholding should reference AW-07-2295 and should be addressed to James A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company, LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Questions or requests for additional information related to the content and preparation of this response should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

D063
D079
NR0

Very truly yours,



A. Sterdis, Manager
Licensing and Customer Interface
Regulatory Affairs and Standardization

/Attachment

1. "Oath of Affirmation," dated June 8, 2007

/Enclosures

1. AW-07-2295 "Application for Withholding Proprietary Information from Disclosure," dated June 8, 2007
2. AW-07-2295, Affidavit, Proprietary Information Notice, Copyright Notice dated June 8, 2007
3. Response to Request for Additional Information on Technical Report No. 28, RAI-TR28-001 (Proprietary)
4. Response to Request for Additional Information on Technical Report No. 28, RAI-TR28-001 (Non-Proprietary)

cc:	D. Jaffe	-	U.S. NRC	1E	1A
	E. McKenna	-	U.S. NRC	1E	1A
	G. Curtis	-	TVA	1E	1A
	P. Grendys	-	Westinghouse	1E	1A
	P. Hastings	-	Duke Power	1E	1A
	C. Ionescu	-	Progress Energy	1E	1A
	D. Lindgren	-	Westinghouse	1E	1A
	A. Monroe	-	SCANA	1E	1A
	M. Moran	-	Florida Power & Light	1E	1A
	C. Pierce	-	Southern Company	1E	1A
	E. Schmiech	-	Westinghouse	1E	1A
	G. Zinke	-	NuStart/Entergy	1E	1A
	D. Hutchings	-	Westinghouse	1E	1A
	R. Trozzo	-	Westinghouse	1E	1A

ATTACHMENT 1

“Oath of Affirmation”

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:)
NuStart Bellefonte COL Project)
NRC Project Number 740)

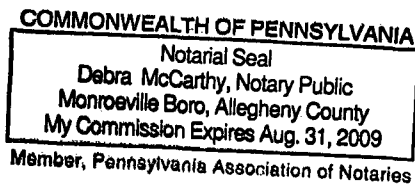
APPLICATION FOR REVIEW OF
"AP1000 GENERAL COMBINED LICENSE INFORMATION"
FOR COL APPLICATION PRE-APPLICATION REVIEW

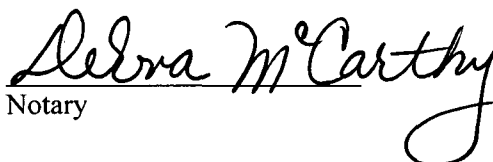
W. E. Cummins, being duly sworn, states that he is Vice President, Regulatory Affairs & Standardization, for Westinghouse Electric Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission this document; that all statements made and matters set forth therein are true and correct to the best of his knowledge, information and belief.



W. E. Cummins
Vice President
Regulatory Affairs & Standardization

Subscribed and sworn to
before me this 8th day
of June 2007.




Notary

ENCLOSURE 1

AW-07-2295

APPLICATION FOR WITHHOLDING
PROPRIETARY INFORMATION FROM DISCLOSURE



Westinghouse Electric Company
Nuclear Services
P.O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

Direct tel: 412-374-6306
Direct fax: 412-374-5005
e-mail: sterdia@westinghouse.com

Your ref: Project Number 740
Our ref: AW-07-2295

June 8, 2007

APPLICATION FOR WITHHOLDING PROPRIETARY
INFORMATION FROM PUBLIC DISCLOSURE

Subject: Transmittal of Proprietary Information, AP1000 COL Response to Requests for Additional Information (TR #28)

The Application for Withholding is submitted by Westinghouse Electric Company, LLC (Westinghouse), pursuant to the provisions of Paragraph (b) (1) of Section 2.390 of the Commission's regulations. It contains commercial strategic information proprietary to Westinghouse and customarily held in confidence.

The proprietary material for which withholding is being requested is identified in the proprietary version of the subject report. In conformance with 10 CFR Section 2.390, Affidavit AW-07-2295 accompanies this Application for Withholding, setting forth the basis on which the identified proprietary information may be withheld from public disclosure.

Accordingly, it is respectfully requested that the subject information which is proprietary to Westinghouse be withheld from public disclosure in accordance with 10 CFR Section 2.390 of the Commission's regulations.

Correspondence with respect to this Application for Withholding or the accompanying affidavit should reference AW-07-2295 and should be addressed to James A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company, LLC, P.O. Box, Pittsburgh, Pennsylvania, 15230-0355.

Very truly yours,

A handwritten signature in black ink, appearing to read 'James W. Winters'.

James W. Winters
Manager
Standardization and Configuration Management

cc: J. Thompson - U.S. NRC

bcc:	J. A. Gresham	- Westinghouse, Pittsburgh, PA, EC E4-7A	1L
	R. Bastien	- Nivelles, Belgium	1L
	C. Brinkman	- Westinghouse, Rockville, MD	1L
	RCPL Admin	- Westinghouse, Pittsburgh, PA, EC E4-7A	1L

ENCLOSURE 2

Affidavit

June 8, 2007

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA:

SS

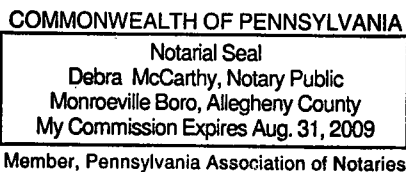
COUNTY OF ALLEGHENY:


Before me, the undersigned authority, personally appeared James W. Winters, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC (Westinghouse), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:



James W. Winters
Manager
Standardization and Configuration Management

Sworn to and subscribed
before me this 8th day
of June 2007.




Notary Public

- (1) I am Manager, Standardization and Configuration Management, Westinghouse Electric Company, LLC (Westinghouse), and as such, I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of Westinghouse.
- (2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse "Application for Withholding" accompanying this Affidavit.
- (3) I have personal knowledge of the criteria and procedures utilized by Westinghouse in designating information as a trade secret, privileged or as confidential commercial or financial information.
- (4) Pursuant to the provisions of paragraph (b)(4) of Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.
 - (i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.
 - (ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitutes Westinghouse policy and provides the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

- (a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

- (b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.
- (c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.
- (d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.
- (e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.
- (f) It contains patentable ideas, for which patent protection may be desirable.

There are sound policy reasons behind the Westinghouse system which include the following:

- (a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.
- (b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.
- (c) Use by our competitor would put Westinghouse at a competitive disadvantage by reducing his expenditure of resources at our expense.
- (d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component

may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

- (e) Unrestricted disclosure would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.
 - (f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.
- (iii) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390, it is to be received in confidence by the Commission.
- (iv) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.
- (v) The proprietary information sought to be withheld in this submittal is that which is appropriately marked in RAI-TR28-001 (Proprietary), in support of Combined License application pre-application activities for the NuStart Bellefonte COL Project being transmitted by Westinghouse letter (DCP/NRC1928) and Application for Withholding Proprietary Information from Public Disclosure, to the Document Control Desk. The proprietary information as submitted by Westinghouse for the AP1000 NuStart Bellefonte plant is expected to be applicable in other licensee submittals in response to certain NRC requirements for justification of compliance of the safety system to regulations.

This information is part of that which will enable Westinghouse to:

- (a) Manufacture and deliver products to utilities based on proprietary system designs.
- (b) Advance the AP1000 Design and reduce the licensing risk for the application of the AP1000 Design Certification

- (c) Determine compliance with regulations and standards
- (d) Establish design requirements and specifications for the system.

Further this information has substantial commercial value as follows:

- (a) Westinghouse plans to sell the use of similar information to its customers for purposes of plant construction and operation.
- (b) Westinghouse can sell support and defense of safety systems based on the technology in the reports.
- (c) The information requested to be withheld reveals the distinguishing aspects of an approach and schedule which was developed by Westinghouse.

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar digital technology safety systems and licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.

PROPRIETARY INFORMATION NOTICE

Transmitted herewith are proprietary and/or non-proprietary versions of documents furnished to the NRC in connection with requests for generic and/or plant-specific review and approval.

In order to conform to the requirements of 10 CFR 2.390 of the Commission's regulations concerning the protection of proprietary information so submitted to the NRC, the information which is proprietary in the proprietary versions is contained within brackets, and where the proprietary information has been deleted in the non-proprietary versions, only the brackets remain (the information that was contained within the brackets in the proprietary versions having been deleted). The justification for claiming the information so designated as proprietary is indicated in both versions by means of lower case letters (a) through (f) located as a superscript immediately following the brackets enclosing each item of information being identified as proprietary or in the margin opposite such information. These lower case letters refer to the types of information Westinghouse customarily holds in confidence identified in Sections (4)(ii)(a) through (4)(ii)(f) of the affidavit accompanying this transmittal pursuant to 10 CFR 2.390(b)(1).

COPYRIGHT NOTICE

The reports transmitted herewith each bear a Westinghouse copyright notice. The NRC is permitted to make the number of copies of the information contained in these reports which are necessary for its internal use in connection with generic and plant-specific reviews and approvals as well as the issuance, denial, amendment, transfer, renewal, modification, suspension, revocation, or violation of a license, permit, order, or regulation subject to the requirements of 10 CFR 2.390 regarding restrictions on public disclosure to the extent such information has been identified as proprietary by Westinghouse, copyright protection notwithstanding. With respect to the non-proprietary versions of these reports, the NRC is permitted to make the number of copies beyond those necessary for its internal use which are necessary in order to have one copy available for public viewing in the appropriate docket files in the public document room in Washington, DC and in local public document rooms as may be required by NRC regulations if the number of copies submitted is insufficient for this purpose. Copies made by the NRC must include the copyright notice in all instances and the proprietary notice if the original was identified as proprietary.

ENCLOSURE 4

Response to Requests for Additional Information on Technical Report No. 28

RAI-TR28-001

(Non-Proprietary)

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-TR28-001
Revision: 0

Question:

According to the Westinghouse Setpoint Methodology, TA (Total Allowance) is equal to CSA (Channel Statistical Allowance) plus Margin ($TA = CSA + \text{Margin}$). All appropriate and applicable uncertainties, as defined by the AP1000 baseline design input documentation, have been considered for each Reactor Trip System (RTS)/Engineered Safety Features Actuation System (ESFAS) function to calculate the CSA. Provide technical basis regarding how Margin or TA has been calculated/developed.

Westinghouse Response:

Section 3.2 of the Westinghouse Setpoint Methodology (issued by Reference 1) provides the following five definitions, which are associated with the NRC question:

- Channel Statistical Allowance (CSA)

The combination of the various channel uncertainties via SRSS and algebraic techniques. It includes instrument (sensor and process rack) uncertainties and non-instrument related effects (process measurement accuracy), see Equation 2.1. This parameter is compared with the TA for determination of instrument channel margin.

- Margin

The calculated difference (in % instrument span) between the TA and the CSA.

$\text{Margin} = TA - CSA$

- Nominal Trip Setpoint (NTS)

The trip setpoint defined in the plant technical specifications and plant procedures. This value is the nominal value programmed into the digital process racks.

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

- Safety Analysis Limit (SAL)

The parameter value in the Final Safety Analysis Report (FSAR) safety analysis or other plant operating limit at which a reactor trip or actuation function is assumed to be initiated.

- Total Allowance (TA)

The absolute value of the difference (in % instrument span) between the SAL and the NTS.

$$TA = |SAL - NTS|$$

For the functions addressed in the Westinghouse Setpoint Methodology, the numerical values for these five parameters are summarized in Table 3-35 of that document. The relationship between these parameters for a high actuation function is illustrated below in Figure 1. A general discussion of the determination of each parameter is provided below.

Where applicable, the Safety Analysis Limits (SALs) were previously defined and are documented in Chapter 15 of Tier 2 of the AP1000 DCD. For example, the Power Range Neutron Flux - High Reactor Trip function is assumed by the accident analysis to actuate at 118 % Rated Thermal Power (RTP). This limit is documented in Table 15.0-4a of the AP1000 DCD, as well as in Table 3-35 of the Westinghouse Setpoint Methodology. The SALs are treated as strict limits that cannot be exceeded, and they must be demonstrated to be preserved based on consideration of instrument uncertainties and the plant setpoints.

The Nominal Trip Setpoints (NTS) correspond to the expected plant settings for the Reactor Trip or Engineered Safety Features Actuation functions, and have been derived in a variety of ways, including 1) historical operating experience for the traditional functions, 2) Systems Engineering defined NTS values based on engineering judgment/design knowledge for those functions that are unique to AP1000, or 3) for functions with no defined NTS from Systems Engineering, application of instrument uncertainty and margin to the SAL. As an example for Case 1, the NTS of 109 % RTP for the Power Range Neutron Flux – High Reactor Trip function has been demonstrated to be reasonable based on many years of operating experience with

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

Westinghouse PWRs, and is expected to be appropriate for AP1000 based on the ongoing margin to trip analyses. As an example for Case 2, there is no explicit SAL for the Reactor Coolant Pump Trip based on High Pump Bearing Water Temperature, and the System Engineers selected a setpoint of 230 °F, based on operational considerations. As an example for Case 3, for the Core Makeup Tank low level setpoint for Stage 1 ADS actuation, there is no operating history since this function is unique to AP1000. In this case, the NTS of 61.9 % level span was based on offsetting the SAL of 67.5 % tank volume by the calculated instrument uncertainty and approximately []^{a,c} level span margin.

Having determined the SAL and NTS, as discussed above, the difference is referred to as the Total Allowance (TA). As shown in Figure 1, the TA defines a maximum acceptable value for the calculated instrument uncertainty, referred to as the Channel Statistical Allowance (CSA). As long as the CSA is less than or equal to the TA, the NTS preserves the SAL, and the NTS is confirmed to be acceptable from a safety perspective. In practice, the NTS and SAL are typically situated such that, after accounting for uncertainties, there is a residual of at least several tenths or more % span, referred to as Margin (see Figure 1). However, although not desirable, a zero margin calculation is considered to be acceptable since the SAL is preserved. If the TA is insufficient to accommodate the CSA, then the SAL and/or the NTS are typically adjusted, typically to result in a Margin of approximately []^{a,c} (general rule of thumb). Referring to the Power Range Neutron Flux – High Reactor Trip example cited previously, Table 3-35 of the Setpoint Methodology documents the TA as 9 % RTP (118 % RTP – 109 % RTP), which is equivalent to 7.5 % instrument span. Based on a CSA of []^{a,c}, the Margin is []^{a,c}. The TA and Margin for the remaining parameters in Table 3-35 were determined in the same manner.

Based on the previous discussion it is concluded that, since the SALs have been previously identified for AP1000, the TA and/or Margin are dictated by the NTS and the CSA. Since the CSA is primarily determined by the AP1000 plant design, it is further concluded that the magnitudes of the TA and Margin are essentially determined by the NTS. The NTS is determined on a case by case basis, as described earlier, through a combination of historical values (where available), analysis, and uncertainty calculations. The NTS values will be updated, as appropriate, as the AP1000 margin to trip analyses are completed, as noted in Section 4.3, Item 6 of the Setpoint Methodology.

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

Reference:

1. APP-GW-GLR-024, Revision 0 , "AP1000 Standard Combined License Technical Report, AP1000 Setpoint Calculations for Protective Functions, Revision 0," (Technical Report Number 28).

Design Control Document (DCD) Revision:

None

PRA Revision:

None

Technical Report (TR) Revision:

None



AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

Figure 1: Typical Setpoint Layout (increasing function)

